PATH ANALYSIS & PERFORMANCE CALCULATIONS
FOR LINE-OF SIGHT MICROWAVE SYSTEMS DATE 04-10-1992
BY: TELECOMMUNICATIONS DESIGN SERVICES
FOSTER CITY, CALIFORNIA

ANALYSIS FOR APCN TEST JOB NUMBER 920409.1
DESIGN BASED UPON A HARRIS FARINON LR1-2 RADIO OPERATING AT 2.145 GHZ

LOCATIONS	AAAAAAAAA		CCCCCCCCC
COORDINATES	0 - 0 - 0		0 - 0 - 0
----------	0 - 0 - 0		0 - 0 - 0
ELEVATIONS	0 FT		0 FT
PATH LENGTH		60 MILES	
FREE SPACE LOSS		138.79 DB	
ATMOSPHERIC ABSORPTION		.67 DB	
MISCELLANEOUS LOSS		0 DB	
TRANSMISSION LINE LENGTH	50 FT		50 FT
TYPE/LOSS	7/8" FOAM/ 1.1 DB		7/8" FOAM/ 1.1 DB
JUMPER LOSS	.25 DB		.25 DB
TRANSMITTER LOSS		1 DB	
RECEIVER LOSS		1.5 DB	
SAFETY FACTOR	1 DB		1 DB
**********			
TOTAL LOSSES		146.65 DB	
**********			
ANTENNA SIZE	10 FT		10 FT
ANTENNA HEIGHT	25 FT		25 FT
ANTENNA INPUT POWER	25.6 DBM		25.6 DBM
ANTENNA GAINS	34.12 DB		34.12 DB
EFFECTIVE RADIATED POWER	59.72 DBM		59.72 DBM
TRANSMIT POWER		28 DBM	
**********			
TOTAL GAINS		96.24 DB	
**********			
UNFADED RECEIVE LEVEL		-50.42 DBM	
RADIO THRESHOLD		-87 DBM	
FADE MARGIN		36.58 DB	
AVAILABILITY		99.99841 %	
OUTAGE IN MINUTES/YR		8.395958	

THIS PATH DESIGN IS BASED UPON BARNETT & VIGANTS
FACTORS OF .25 FOR TERRAIN AND .25 FOR CLIMATE

THIS RADIO IS DESIGNED FOR A HOT STAND-BY CONFIGURATION

REPLACEMENT 60 MILE 6.125 GHZ MICROWAVE PATH

PATH ANALYSIS & PERFORMANCE CALCULATIONS
FOR LINE-OF SIGHT MICROWAVE SYSTEMS DATE 04-10-1992
BY: TELECOMMUNICATIONS DESIGN SERVICES
FOSTER CITY, CALIFORNIA

ANALYSIS FOR APCN TEST JOB NUMBER 920409.1
DESIGN BASED UPON A HARRIS FARINON DVM6-8T RADIO OPERATING AT 6.7 GHZ

LOCATIONS	AAAAAAAAA		CCCCCCCCC
COORDINATES	0 - 0 - 0		0 - 0 - 0
----------	0 - 0 - 0		0 - 0 - 0
ELEVATIONS	0 FT		0 FT
PATH LENGTH		60 MILES	
FREE SPACE LOSS		148.68 DB	
ATMOSPHERIC ABSORPTION		1.29 DB	
MISCELLANEOUS LOSS		0 DB	
TRANSMISSION LINE LENGTH	50 FT		50 FT
TYPE/LOSS	EW-64/ .8 DB	EW-64/ .8 DB	
JUMPER LOSS	.25 DB		.25 DB
TRANSMITTER LOSS		1 DB	
RECEIVER LOSS		1.5 DB	
SAFETY FACTOR	1 DB		1 DB
**********			
TOTAL LOSSES		156.56 DB	
**********			
ANTENNA SIZE	12 FT		15 FT
ANTENNA HEIGHT	25 FT		25 FT
ANTENNA INPUT POWER	26.9 DBM		26.9 DBM
ANTENNA GAINS	45.6 DB		47.54 DB
EFFECTIVE RADIATED POWER	72.5 DBM		74.44 DBM
TRANSMIT POWER		29 DBM	
**********			
TOTAL GAINS		122.14 DB	
**********			
UNFADED RECEIVE LEVEL		-34.43 DBM	
RADIO THRESHOLD		-78 DBM	
FADE MARGIN		43.57 DB	
AVAILABILITY		99.99901 %	
OUTAGE IN MINUTES/YR		5.200481	

THIS PATH DESIGN IS BASED UPON BARNETT & VIGANTS
FACTORS OF .25 FOR TERRAIN AND .25 FOR CLIMATE

THIS RADIO IS DESIGNED FOR A HOT STAND-BY CONFIGURATION

EQUIVALENT 30 MILE 6.125 GHZ MICROWAVE PATH

PATH ANALYSIS & PERFORMANCE CALCULATIONS
FOR LINE-OF SIGHT MICROWAVE SYSTEMS DATE 04-10-1992
BY: TELECOMMUNICATIONS DESIGN SERVICES
FOSTER CITY, CALIFORNIA

ANALYSIS FOR APCN TEST JOB NUMBER 920409.1
DESIGN BASED UPON A HARRIS FARINON DVM6-8T RADIO OPERATING AT 6.7 GHZ

LOCATIONS	AAAAAAAAA		CCCCCCCCC
COORDINATES	0 - 0 - 0		0 - 0 - 0
----------	0 - 0 - 0		0 - 0 - 0
ELEVATIONS	0 FT		0 FT
PATH LENGTH		30 MILES	
FREE SPACE LOSS		142.66 DB	
ATMOSPHERIC ABSORPTION		.64 DB	
MISCELLANEOUS LOSS		0 DB	
TRANSMISSION LINE LENGTH	50 FT		50 FT
TYPE/LOSS	EW-64/ .8 DB	EW-64/ .8 DB	
JUMPER LOSS	.25 DB		.25 DB
TRANSMITTER LOSS		1 DB	
RECEIVER LOSS		1.5 DB	
SAFETY FACTOR	1 DB		1 DB
**********			
TOTAL LOSSES		149.9 DB	
**********			
ANTENNA SIZE	8 FT		8 FT
ANTENNA HEIGHT	25 FT		25 FT
ANTENNA INPUT POWER	26.9 DBM		26.9 DBM
ANTENNA GAINS	42.08 DB		42.08 DB
EFFECTIVE RADIATED POWER	68.98 DBM		68.98 DBM
TRANSMIT POWER		29 DBM	
**********			
TOTAL GAINS		113.16 DB	
**********			
UNFADED RECEIVE LEVEL		-36.75 DBM	
RADIO THRESHOLD		-78 DBM	
FADE MARGIN		41.25 DB	
AVAILABILITY		99.99979 %	
OUTAGE IN MINUTES/YR		1.127815	

THIS PATH DESIGN IS BASED UPON BARNETT & VIGANTS
FACTORS OF .25 FOR TERRAIN AND .25 FOR CLIMATE

THIS RADIO IS DESIGNED FOR A HOT STAND-BY CONFIGURATION

TYPICAL PRICING OF 6.125 GHZ MICROWAVE EQUIPMENT REPLACEMENT

APCN OF LOS ANGELES
PROJECT COST ANALYSIS
Apr 9, 1992

NEW REPEATER SITE REQUIREMENT

SITE NAME==========>		AAAAAA	QTY	CCCCCC	QTY	BBBBBB	TOTAL
ITEMS:	QTY						
TELECOMMUNICATIONS ENGINEERING	1	$1,250	1	$1,250	1	$1,250	$3,750
CONSTRUCTION ENGINEERING	1	$3,750	1	$3,750	0	$3,750	$11,250
PROGRAM MANAGEMENT	1	$2,500	1	$2,500	1	$2,500	$7,500
CONSULTANTS	1	$2,167	1	$2,167	1	$2,167	$6,500
FREQUENCY COORDINATION	1	$1,250	1	$1,250	1	$1,250	$3,750
LEGAL SERVICES	1	$1,875	1	$1,875	1	$1,875	$5,625
LICENSE FEES	1	$250	1	$250	1	$250	$750
SITE CONSTRUCTION/INSTALLATION	1	$32,109	1	$32,109	1	$32,109	$96,328
SUB-TOTAL		$45,151		$45,151		$45,151	$135,453
6 GHZ MICROWAVE RADIO TERMINAL	1	$57,500	0	$0	1	$57,500	$115,000
6 GHZ MICROWAVE RADIO REPEATER	0	$0	1	$115,000	0	$0	$115,000
SERVICE CHANNEL & SUPERVISORY	1	$2,500	1	$2,500	1	$2,500	$7,500
T1 CHANNEL BANK	1	$5,000	0	$0	1	$5,000	$10,000
ENGINEERING & INST. MTL.	1	$3,400	1	$3,400	1	$3,400	$10,200
SPARE PARTS & ACCESSORIES	1	$8,778	1	$8,778	1	$8,778	$26,335
SUB-TOTAL		$77,178		$129,678		$77,178	$284,035
POWER PLANT & DIST PNL	0	$0	1	$12,600	0	$0	$12,600
BATTERY RACK (8 HR.)	0	$0	1	$6,000	0	$0	$6,000
STANDBY GENERATOR	0	$0	1	$7,500	0	$0	$7,500
SUB-TOTAL		$0		$26,100		$0	$26,100
8 FOOT PARABOLIC ANTENNAS	1	$7,357	2	$14,714	1	$7,357	$29,428
SUB-TOTAL		$7,357		$14,714		$7,357	$29,428
WAVEGUIDE	50	$750	200	$3,000	50	$750	$4,500
TUNED CONNECTORS	1	$420	1	$420	1	$420	$1,260
PREASSURE WINDOW	2	$76	2	$76	2	$76	$228
DEHYDRATIOR	1	$3,271	1	$3,271	1	$3,271	$9,813
HANGER BRACKETS KITS	1	$295	1	$295	1	$295	$885
WAVEGUIDE GROUNDING KITS	1	$100	1	$100	1	$100	$300
SUB-TOTAL		$4,912		$7,162		$4,912	$16,986
RELAY RACK	1	$301	1	$301	1	$301	$903
DSX CROSS-CONNECT PANEL	2	$3,000	0	$0	2	$3,000	$6,000
SUB-TOTAL		$3,301		$301		$3,301	$6,903
BUILDINGS	0	$0	1	$73,913	0	$0	$73,913
TOWERS (INSTALLED)	0	$0	1	$20,000	0	$0	$20,000
ANTENNA MOUNTS	1	$312	2	$624	1	$312	$1,248
SUB- TOTAL		$312		$94,537		$312	$95,161
INSTALLED SYSTEM COST		$138,211		$317,643		$138,211	$594,066

APCN OF LOS ANGELES
PROJECT COST ANALYSIS
Apr 9, 1992

DIRECT EQUIPMENT REPLACEMENT

SITE NAME==========>		AAAAAA		BBBBBB	TOTAL
ITEMS:	QTY		QTY		
TELECOMMUNICATIONS ENGINEERING	1	$1,250	1	$1,250	$2,500
CONSTRUCTION ENGINEERING	1	$3,750	0	$3,750	$7,500
PROGRAM MANAGEMENT	1	$2,500	1	$2,500	$5,000
CONSULTANTS	1	$2,167	1	$2,167	$4,333
FREQUENCY COORDINATION	1	$1,250	1	$1,250	$2,500
LEGAL SERVICES	1	$1,875	1	$1,875	$3,750
LICENSE FEES	1	$250	1	$250	$500
SITE CONSTRUCTION/INSTALLATION	1	$32,109	1	$32,109	$64,219
SUB-TOTAL		$45,151		$45,151	$90,302
6 GHZ MICROWAVE RADIO TERMINAL	1	$57,500	1	$57,500	$115,000
6 GHZ MICROWAVE RADIO REPEATER	0	$0	0	$0	$0
SERVICE CHANNEL & SUPERVISORY	1	$2,500	1	$2,500	$5,000
T1 CHANNEL BANK	1	$5,000	1	$5,000	$10,000
ENGINEERING & INST. MTL.	1	$3,400	1	$3,400	$6,800
SPARE PARTS & ACCESSORIES	1	$8,778	1	$8,778	$17,557
SUB-TOTAL		$77,178		$77,178	$154,357
POWER PLANT & DIST PNL	0	$0	0	$0	$0
BATTERY RACK (8 HR.)	0	$0	0	$0	$0
STANDBY GENERATOR	0	$0	0	$0	$0
SUB-TOTAL		$0		$0	$0
12/15 FOOT PARABOLIC ANTENNAS	1	$10,200	1	$14,200	$24,400
SUB-TOTAL		$10,200		$14,200	$24,400
WAVEGUIDE	50	$750	50	$750	$1,500
TUNED CONNECTORS	1	$420	1	$420	$840
PREASSURE WINDOW	2	$76	2	$76	$152
DEHYDRATIOR	1	$3,271	1	$3,271	$6,542
HANGER BRACKETS KITS	1	$295	1	$295	$590
WAVEGUIDE GROUNDING KITS	1	$100	1	$100	$200
SUB-TOTAL		$4,912		$4,912	$9,824
RELAY RACK	1	$301	1	$301	$602
DSX CROSS-CONNECT PANEL	2	$3,000	2	$3,000	$6,000
SUB-TOTAL		$3,301		$3,301	$6,602
BUILDINGS	0	$0	0	$0	$0
TOWERS (INSTALLED)	0	$0	0	$0	$0
ANTENNA MOUNTS	1	$312	1	$312	$624
SUB- TOTAL		$312		$312	$624
INSTALLED SYSTEM COST		$141,054		$145,054	$286,109